

Application No. 10/564,025
April 24, 2008
Reply to the Office Action dated February 7, 2008
Page 2 of 8

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

Claims 1-8 (canceled).

Claim 9 (currently amended): A switching power supply device comprising:
a transformer including a primary winding, a secondary winding, and a feedback winding;
a first switching element connected in series to the primary winding;
a control circuit provided between a control terminal of the first switching element and the feedback winding;
a rectifier circuit connected to the secondary winding; and
an output voltage control circuit arranged to detect an output voltage output from the rectifier circuit and feed back the output voltage to the control circuit through a single system; and
an impedance circuit; wherein
the control circuit includes an on-period control circuit arranged to turn off the first switching element in an on-state based on a feedback signal transmitted from the output voltage control circuit through the single system under non-light load, and an off-period control circuit arranged to control an off-period of the first switching element by delaying turn-on of the first switching element based on the feedback signal under light load;
the impedance circuit is arranged to connect the off-period control circuit to the on-period control circuit, the impedance of the impedance circuit changing based on the feedback signal, wherein control of the off-period control circuit under light load and control of the on-period control circuit under non-light load are sequentially performed in accordance with a change in the impedance of the impedance circuit;

Application No. 10/564,025

April 24, 2008

Reply to the Office Action dated February 7, 2008

Page 3 of 8

the on-period control circuit includes a second switching element provided between the control terminal of the first switching element and ground and a time constant circuit including a capacitor arranged to apply a control voltage to the second switching element;

the off-period control circuit includes a third switching element provided between the control terminal of the first switching element and the feedback winding and a fourth switching element provided between a control terminal of the third switching element and ground; and

the impedance circuit includes a first path arranged to feed a current generated by the feedback signal to the capacitor and a second path serving as a bypass to feed the current to ground.

Claims 10 and 11 (canceled).

Claim 12 (previously presented): The switching power supply device according to Claim 9, wherein a minimum on-period is set in the on-period controlled by the on-period control circuit.

Claim 13 (previously presented): The switching power supply device according to Claim 12, wherein the impedance circuit is provided with a clamp circuit arranged to control a voltage of the capacitor in the on-period control circuit for determining the control voltage of the second switching element at a predetermined value when the first switching element is in an off-state.

Claim 14 (currently amended): The switching power supply device according to Claim 14, wherein the second path is a bypass circuit arranged to feed the current generated by the feedback signal only when the first switching element is in an off-state.

Application No. 10/564,025

April 24, 2008

Reply to the Office Action dated February 7, 2008

Page 4 of 8

Claim 15 (previously presented): The switching power supply device according to Claim 9, wherein the off-period control circuit includes a limit circuit arranged to set an upper limit of a voltage applied to the control terminal of the first switching element.

Claim 16 (previously presented): An electronic apparatus comprising a power supply circuit unit including the switching power supply device according to Claim 9.

Claim 17 (new): The switching power supply device according to Claim 9, further comprising a diode in the second path serving as a bypass to feed the current to ground.

Claim 18 (new): The switching power supply device according to Claim 14, wherein the bypass circuit comprises a switching element having a control circuit connected to ground via a resistor.